



# Retail Food Protection #29 Program Information Manual

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**Subject**

Food Supplies - Moldy  
Cheese

INTERPRETATION

Applicable code(s) or  
section(s)

76 FSV 2-101  
78 FVD 2-101  
82 FST 2.101

Part 6 - Inspection  
Chapter 01 - Code Interpretations  
Number 2-101

Question

Is cheese from which mold has been removed considered sound and safe for human consumption?

Discussion

The term "moldy" refers to the presence on cheese of atypical contaminating molds, general species of Penicillium, Aspergillus, Fusarium, Cladosporium and Alternaria.(1) It does not refer to the presence of molds, principally Pennicillium roqueforti and P. caseicolum, which are intentionally added to curd or milk in order to produce such "mold-ripened" cheeses as roquefort, blue, gorgonzola, brie and camembert.(2)

Molds may grow on cheese during the ripening stage, during the curing process or during storage. Many of the common molds are psychrotrophic and grow at refrigeration temperatures.(1),(14) Temperatures around 40°F (4°C) favor the growth of Penicillium sp. over most of the other molds.(3)

All types of cheeses, from the very hard grating cheeses such as parmesan and romano to the soft cheeses like cottage and ricotta, are susceptible to mold growth.

Mold growth on food is usually considered undesirable for reasons of aesthetics. However some mold species, including some found on cheese, are known to produce toxic metabolites (mycotoxins). Aspergillus flavus and A. parasiticus may produce aflatoxins;(1), (4), (5), (6), (10), (16), (20) A. ochraceus - ochratoxin A;(1), (3) A. versicolor - sterigmatocystin; (7), (12), (18), (22) Penicillium-roqueforti - penicillic acid, (1), (2), (12), (14) PR toxin, (2), (13) mycophenolic acid (2), (11) and patulin; (1), (2), (19) P. caseicolum - cyclopiazonic acid;(2), (8) and P. crustosum - penitrem A.(9) These mycotoxins have caused cancer and other adverse effects in experimental animals.

Mold usually grows on the surface of cheese but may penetrate to the inside along air passages such as holes or eyes in swiss-type cheese. Mycotoxins, if produced, are produced by the mold filaments, are closely associated with those filaments and are therefore, near the surface. (4), (7), (8), (18) However, some research indicates that mycotoxins can grate into cheese, particularly if stored for long periods at room temperature.(5), (15)

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Temperature also affects mycotoxin production, at least in Aspergillus sp. Studies have shown that although the Aspergillus may grow under refrigeration, no aflatoxins are produced.(6),(17),(21)

As a result of the potential safety considerations, moldy cheese is not considered "sound and safe" under Section 2-101 of the model food sanitation codes.

Nevertheless, under certain prescribed circumstances some moldy cheese may be restored to a sound and safe condition by carefully cutting off and discarding:

\*a layer at least one-half inch (1.3 cm) thick, if the cheese became moldy while being held at or below 45°F (7°C); or

\*a layer at least one inch (2.5 cm) thick, if the cheese became moldy while being held above 45°F (7°C).

The cutting must be done carefully to minimize the possibility of contaminating the newly exposed cheese surface.

Cheese which is too small for the required cutting, which has a high moisture content (such as cottage or ricotta) or which has mold filaments deeply penetrating along the holes or eyes cannot be made sound and safe.

Methods other than cutting off the surface layer, such as washing or scraping, would not remove mycotoxins, if present, and are therefore unacceptable.

### Interpretation

Cheese from which mold has been properly removed is considered sound and safe

### References

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